direction,, should give equal deflection to the instrument with the discharge of ordinary electricity from the battery (99, 100); and a new part of the zinc wire having been brought into position with the platina, the comparative experiments were made.

106. On plunging the zinc and platina wires five-eighths of an inch deep into the acid, and retaining them there for eight beats of the watch (after which they were quickly withdrawn); the needle was deflected, and continued to advance in the same direction some time after the voltaic apparatus had been removed from the acid. It attained the five-and-a-half division, and then returned swinging an equal distance on the other side.

This experiment was repeated many times,, and always with the same result.

107. Hence, as an approximation, and judging from *magnetic force* only at present (112), it would appear that two wires, one of platina and one of zinc, each one-eighteenth of an inch in diameter, placed five-sixteenths of an inch apart and immersed to the depth of five-eighths of an inch in acid, consisting of one drop oil of vitriol and four ounces distilled water, at a temperature about 60°, and connected at the other extremities by a copper wire eighteen feet long and one-eighteenth of an inch thick (being the wire of the galvanometer coils), yield as much electricity in eight beats of my watch, or in r l^-ths • of a minute, as the electrical battery charged by thirty turns of the large machine, in excellent order (99, 100). Notwithstanding this apparently enormous disproportion, the results are perfectly in harmony with those'effects which are known to be produced by variations in the intensity and quantity of the electric fluid.

108. In order to procure a reference to *chemical action,* the wires were now retained immersed in the acid to the depth of five-eighths of an inch, and the needle, when stationary, observed; it stood., as nearly as the unassisted eye could decide, at 5^ division. Hence a permanent deflection to that extent might be considered as indicating a constant voltaic current, which in eight beats of my watch (105) could supply as much electricity as the electrical battery charged by thirty turns of the machine.

109. The following arrangements and results are selected from many that were made and obtained relative

to chemical
action. A platina wire one-twelfth of an inch in diameter,
weighing two hundred and sixty grains, had the extremity
rendered plain, so as to offer a definite surface equal to a circle
of the same diameter as the wire; it was then connected in turn
with the conductor of the machine, or with the voltaic apparatus